

1. *Chlorophyll a* (Chl *a*) is the primary photosynthetic pigment in most plants and algae. It is a green pigment that absorbs light energy in the blue and red regions of the visible spectrum. Chl *a* is essential for the light-dependent reactions of photosynthesis, where it converts light energy into chemical energy.

2. *Chlorophyll b* (Chl *b*) is an accessory pigment found in green plants and algae. It absorbs light energy in the blue and orange-red regions of the visible spectrum. Chl *b* transfers the absorbed energy to Chl *a* for use in photosynthesis.

3. *Carotenoids* are a group of pigments that include carotenes and xanthophylls. They absorb light energy in the blue and green regions of the visible spectrum. Carotenoids play a role in photosynthesis by transferring energy to Chl *a* and also protect the photosynthetic apparatus from damage by excess light energy.

4. *Xanthophylls* are a subclass of carotenoids that include pigments like lutein and zeaxanthin. They absorb light energy in the blue and green regions of the visible spectrum. Xanthophylls are involved in the light-harvesting complex and also play a role in the xanthophyll cycle, which helps regulate the light intensity absorbed by the photosynthetic system.

5. *Anthocyanins* are water-soluble pigments that give plants red, purple, and blue colors. They are not directly involved in photosynthesis but can protect plants from damage by absorbing excess light energy and acting as antioxidants.

6. *Flavonoids* are a large group of plant pigments that include flavones, flavonols, and flavanones. They are responsible for yellow, orange, and brown colors in plants. Flavonoids have various functions, including UV protection, signaling, and defense against pathogens.

7. *Anthraquinones* are a class of pigments that give plants red, orange, and yellow colors. They are primarily found in the roots and stems of certain plants and are involved in various physiological processes, including defense and signaling.

8. *Alkaloids* are a diverse group of nitrogen-containing compounds that can give plants various colors, including red, orange, and yellow. They are often involved in defense against herbivores and pathogens.

9. *Terpenoids* are a large group of pigments that include carotenoids and other compounds responsible for a wide range of colors in plants, from red and orange to blue and purple. They are involved in various physiological processes, including photosynthesis, defense, and signaling.

10. *Phenolics* are a group of pigments that include flavonoids and other compounds that can give plants various colors, including red, orange, and yellow. They are involved in various physiological processes, including defense and signaling.

(FIG. 4)